AIRLINE OPERATIONS MANAGERS:
AN INTRODUCTION TO THE THIRD LEG OF THE NATIONAL AIR TRANSPORTATION SYSTEM

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Outline

- Airline Operational Managers (AOM)
- Introduction to Contextual Inquiry
- Cognitive Models
  - Flow Model
  - Physical Models
  - Artifact Models
  - Cultural Model
  - Sequence Models
- AOM Impact on NAS Performance

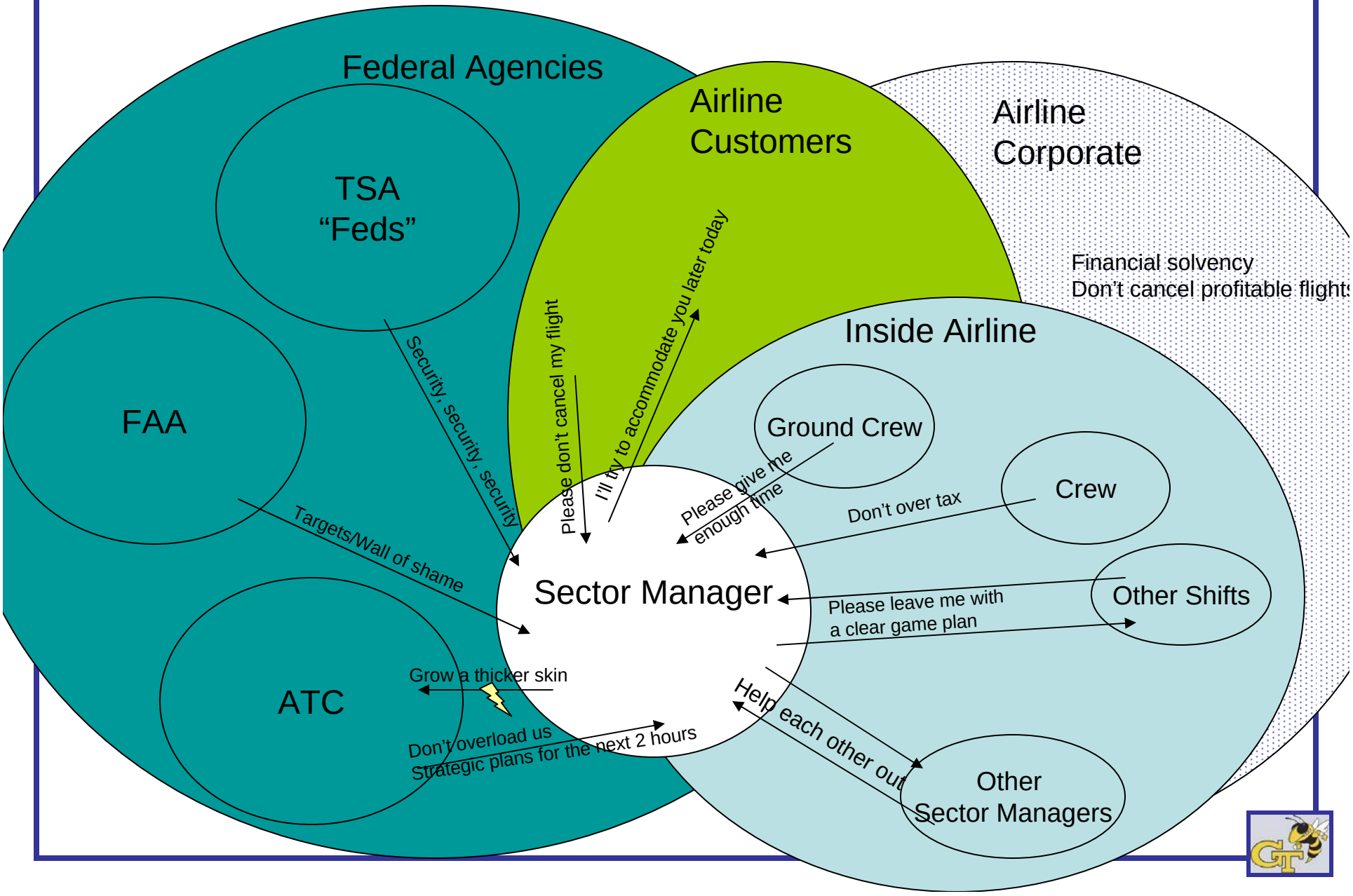
Airline Operational Managers

- Primary Task
  - maintain the airline's published schedule
  - ensuring that the on-time arrival and departure rates are within acceptable limits
- Techniques
  - Canceling flights or segments
  - Delaying flights or segments
  - Adding additional flights or aircraft
  - Swapping aircraft, pilots, crew
- Experience
  - 20+ years in company

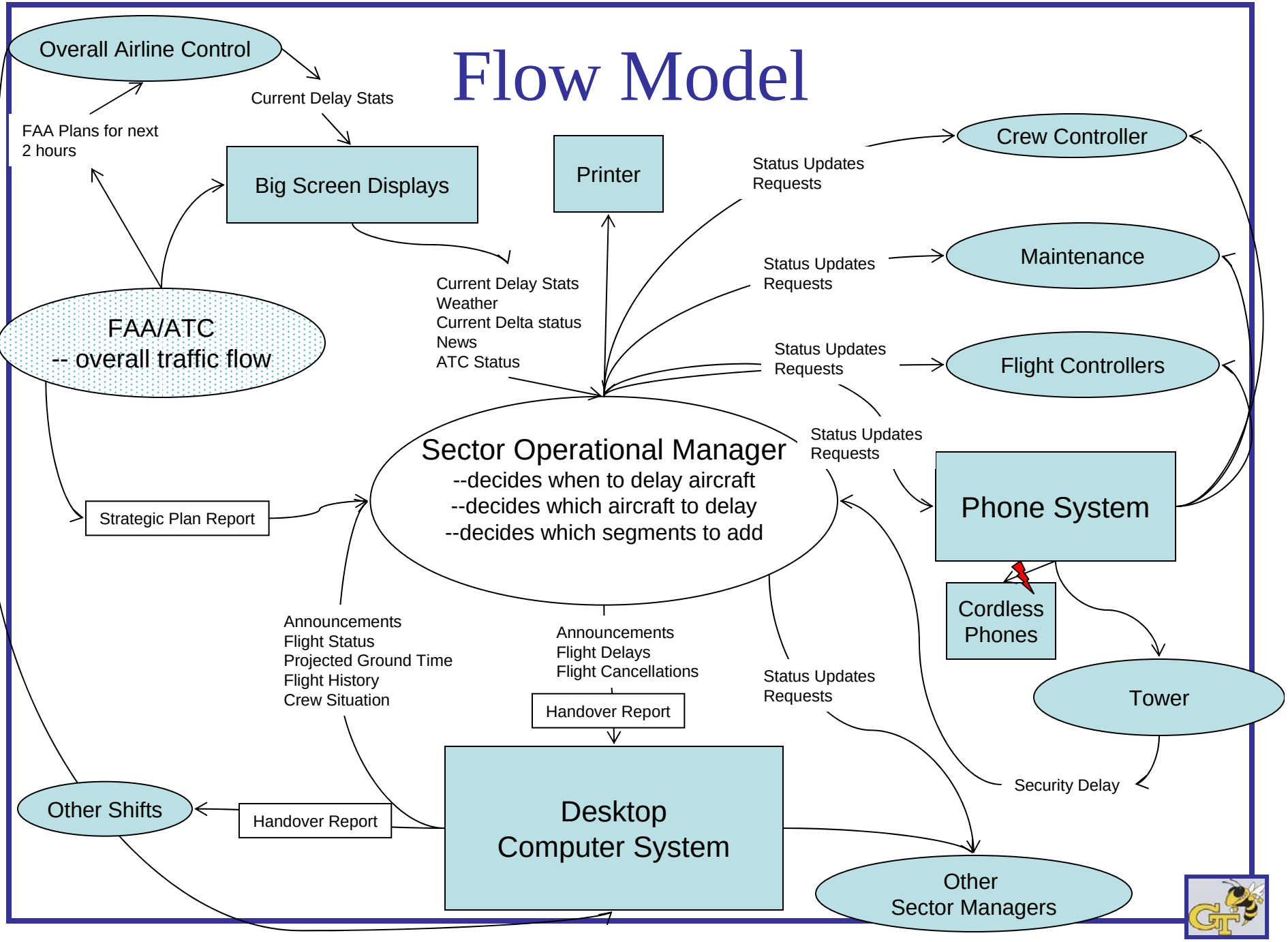
Contextual Inquiry

- Interviewing technique described by Beyer & Holtzblatt
- 4 Guiding Principles
  - Context – interview must be conducted in context
  - Partnership – adopt a mentor-mentee relationship
  - Interpretation – observations should be transformed into a set of cognitive models
  - Focus – interviewer should be an active observer: asking questions and steering conversation

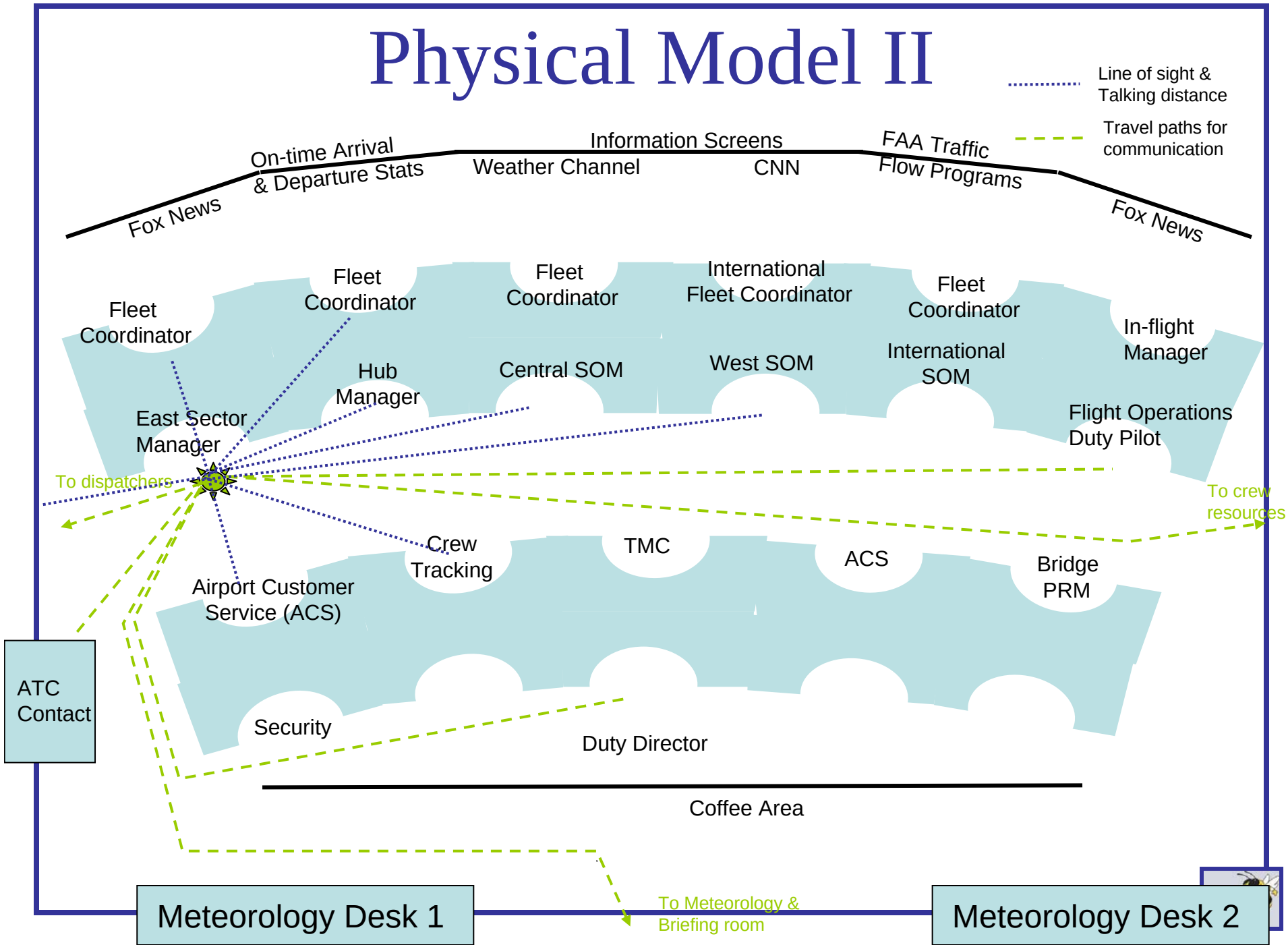
Cultural Model



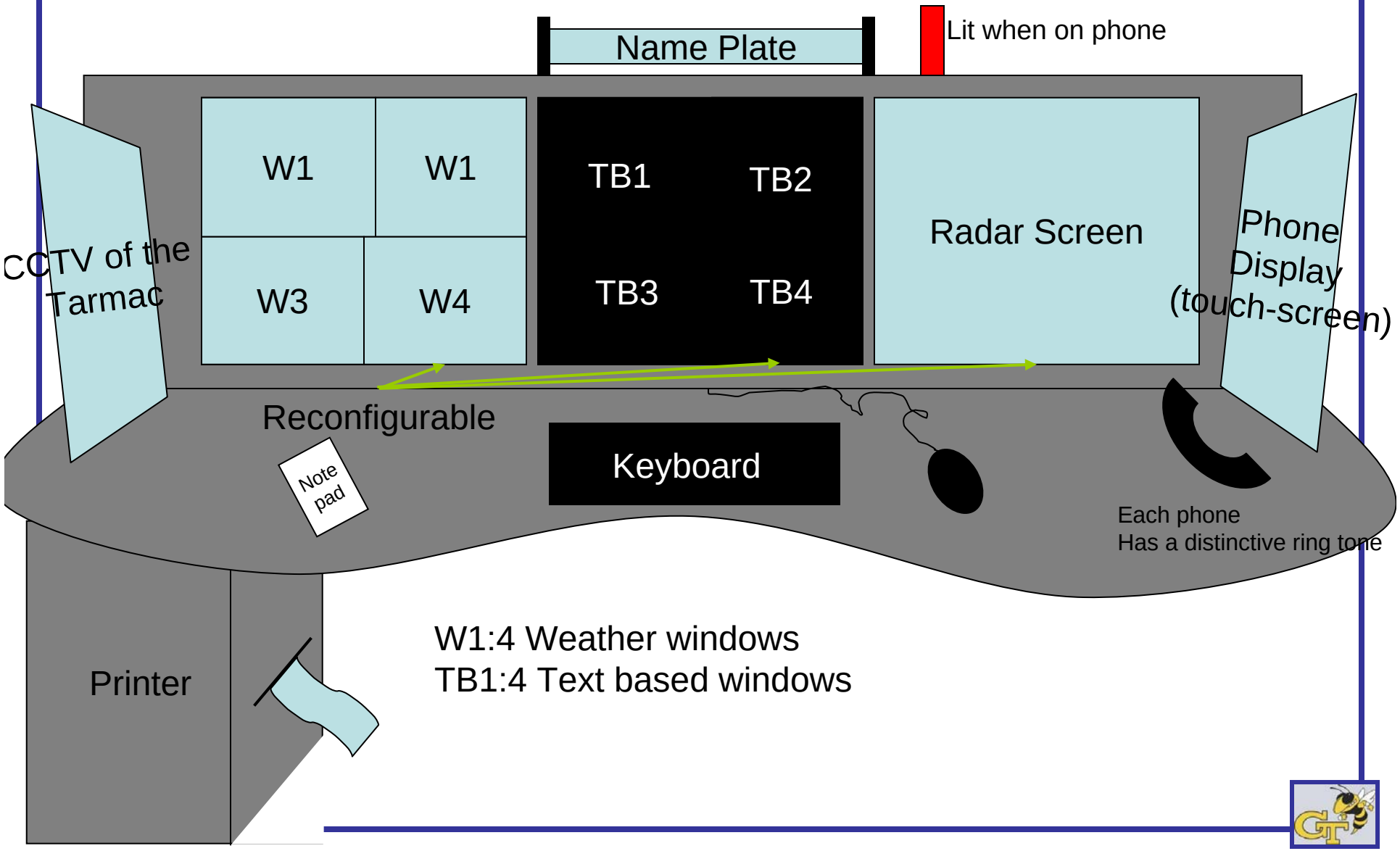
Flow Model


Overall Airline Control
Current Delay Stats
FAA Plans for next
2 hours
Big Screen Displays
Printer
Crew Controller
Status Updates
Requests
Maintenance
Status Updates
Requests
Flight Controllers
Status Updates
Requests
Current Delay Stats
Weather
Current Delta status
News
ATC Status
FAA/ATC
-- overall traffic flow
Sector Operational Manager
--decides when to delay aircraft
--decides which aircraft to delay
--decides which segments to add
Status Updates
Requests
Phone System
Strategic Plan Report
Cordless
Phones
Tower
Announcements
Flight Status
Projected Ground Time
Flight History
Crew Situation
Announcements
Flight Delays
Flight Cancellations
Handover Report
Status Updates
Requests
Security Delay
Other Shifts
Handover Report
Desktop
Computer System
Other
Sector Managers

Physical Model II



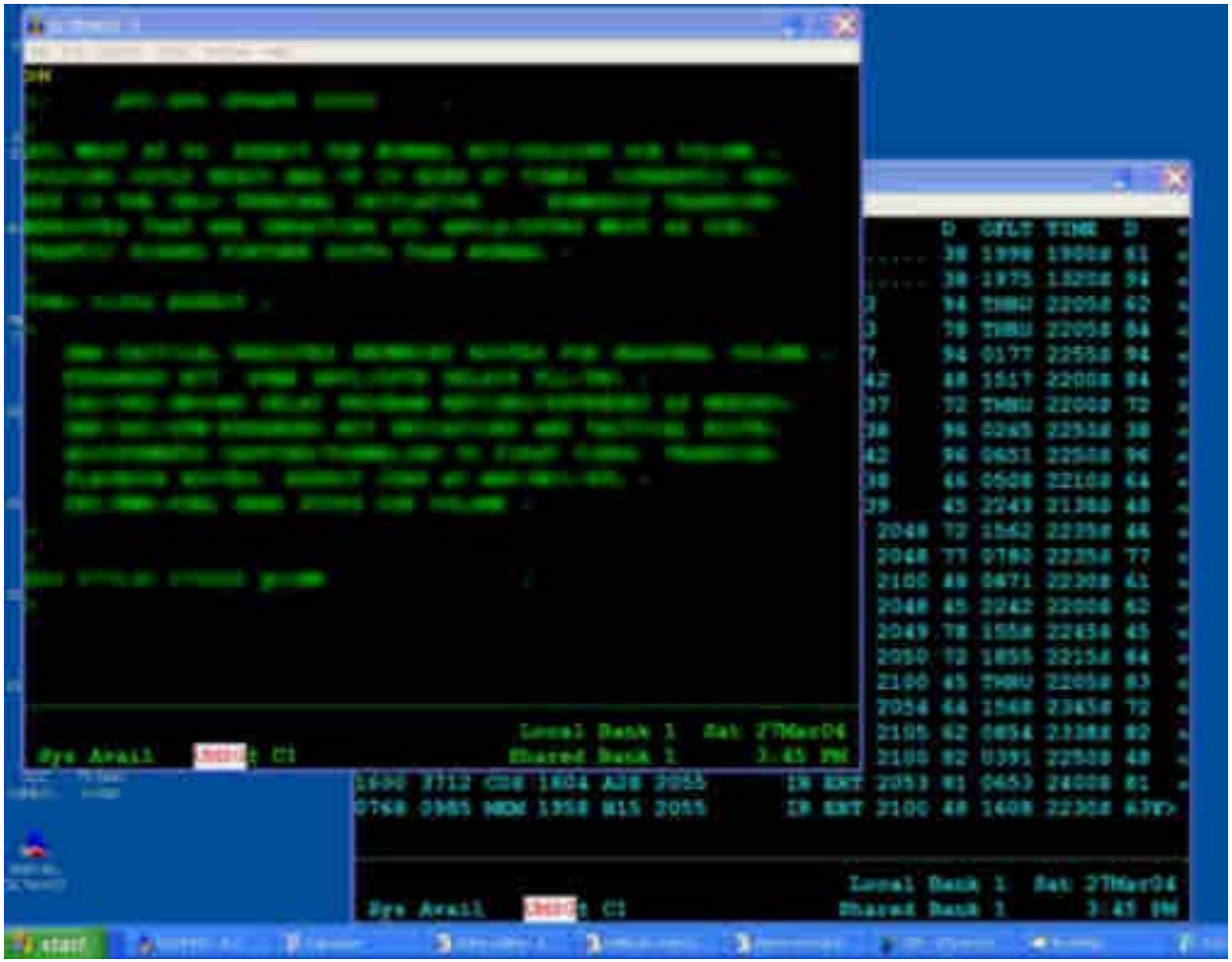
Artifact Model: Desktop



W1:4 Weather windows
TB1:4 Text based windows

Artifact Model: DLTERM32

- Old text-based interface
- Primary interface used
- Primary source of information
- Requires memorization of text commands much like Unix or Linux
- Typos are a frequent problem

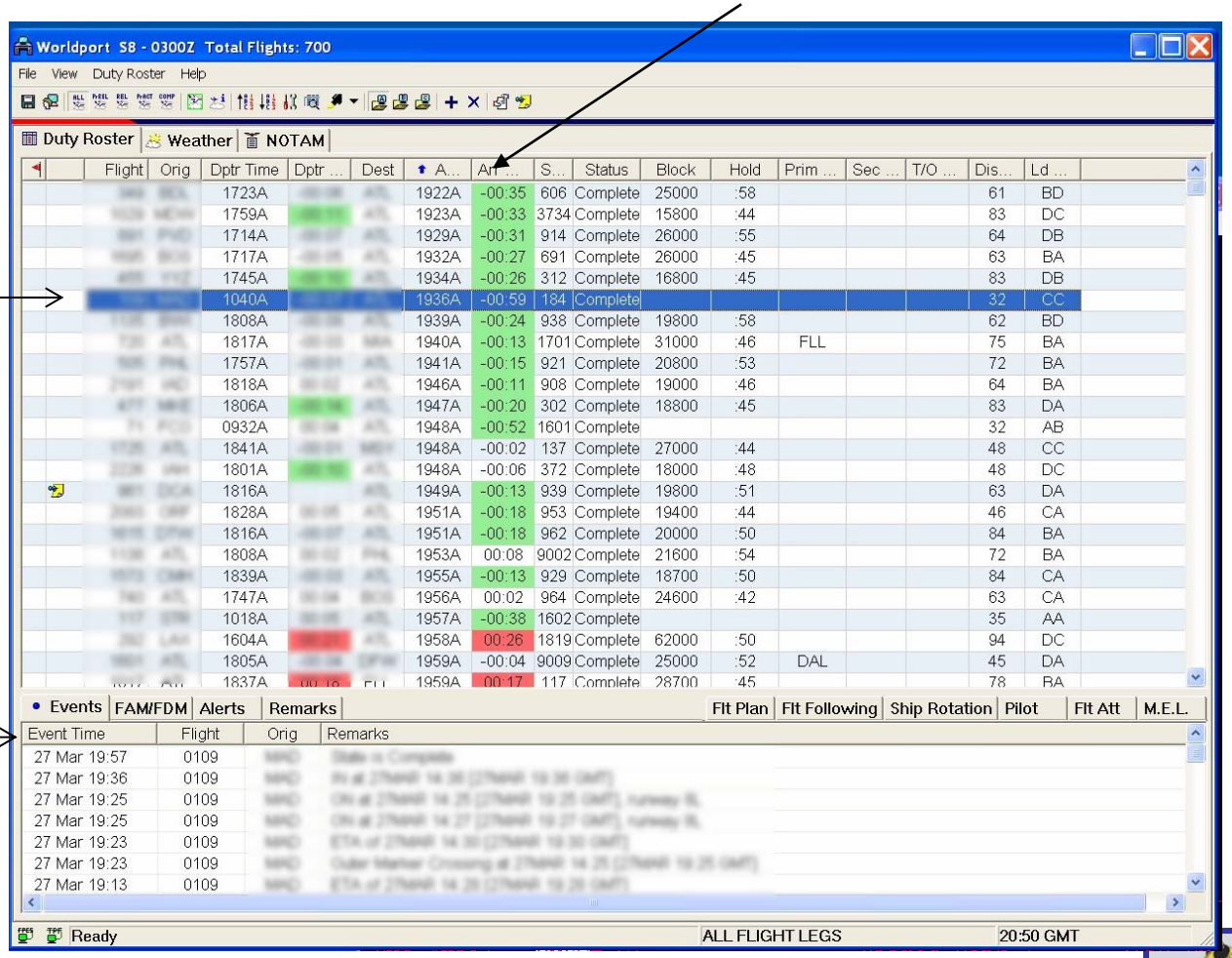


Artifact Model: ODT

- List of flights ranked by arrival time
- Serves a a primary cue
- ✘Has 3 views, but only Duty Roster seems to be used
- ✘Weather and NOTAM are provided by other packages

Highlighted row will bring up history in lower pane

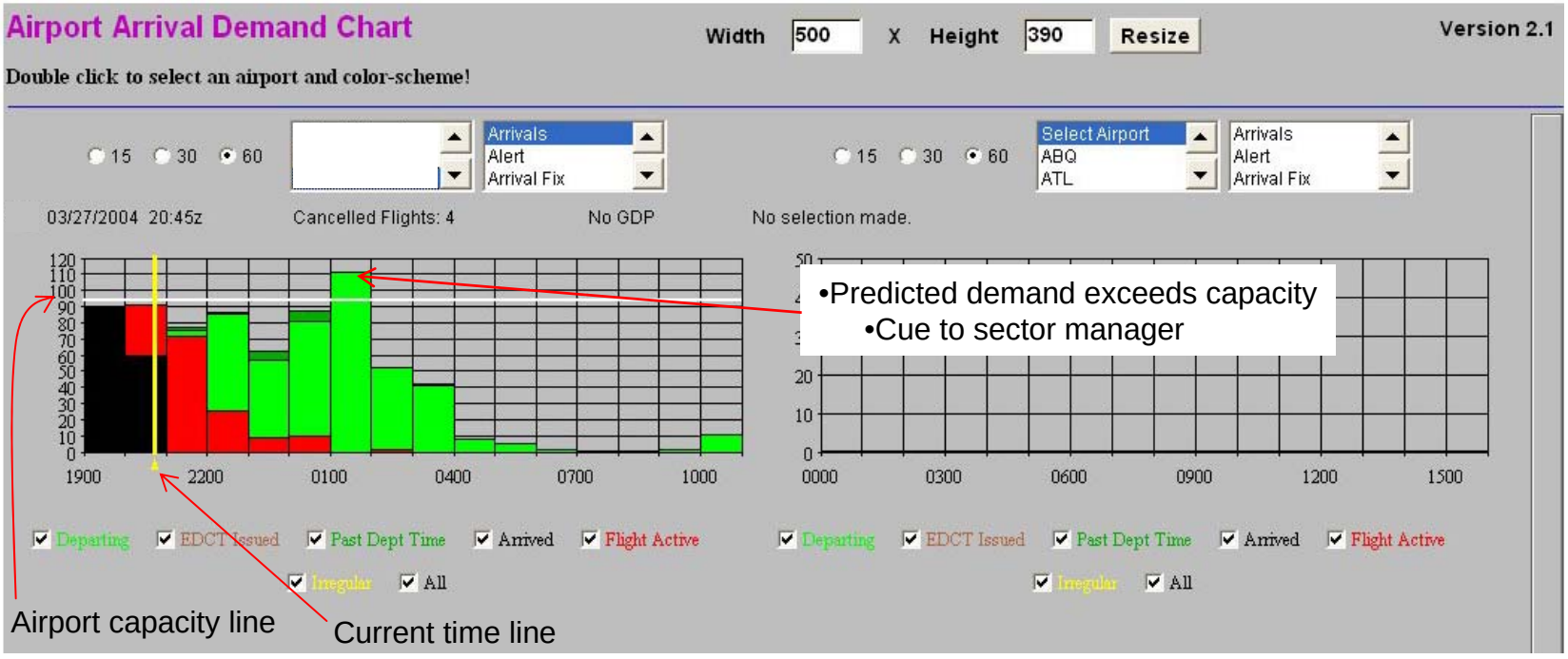
Arrival time:
Light Gray = early
Dark Gray = late
Sector managers look out for late flights



Artifact Model: Predicted Airport Demand

Tool provided by the FAA via the web

- Shows previous airport demand
- Current airport demand
- Predicted airport demand



Sequence Model:
Get plane in ahead of other traffic

- Trigger: Airline Tower Call
  - Indicated that an aircraft was significantly behind its scheduled arrival time
- Intent: Verify that aircraft is behind lots of other traffic & if so plot solution
  - Checked graphical location of aircraft on radar display
  - Pulled up info on aircraft on the text-based window
- Intent: Aircraft will be OK if it can be brought in ahead of all other Airline traffic
  - Got up and went to talk to the FAA SOM to ask if the aircraft can have priority
  - FAA contact will talk to his counterpart with the commuter airline
- Intent: Make sure that the passengers make their connections even if it means holding other aircraft for a few minutes
  - Calls dispatcher to tell them about connections so dispatch might hold the planes and allow the connections to be made
- Intent: Keep the Airline Tower up to date
  - Calls Airline Tower back and updates him of current status
- Intent: Make sure that the plane has a place to go when it gets down
  - Checks the gate availability

Sequence Model: Fuel Delays

- Trigger: Using the ODT, East SOM noticed that a plane out of Raleigh was late for no apparent reason
- Intent: find out what might be causing the delay
- Intent: ask for tankering out of Hub to minimize overall system delays caused by Raleigh
- Intent: to inform Raleigh that the request had been denied and why
- Intent: to inform his fellow sector managers and to find out if any of them knew, and how he managed not to know about the fuel shortage
- Intent: to inform follow on crews about the fuel shortage and Raleigh delay issues.

- E-SOM used TERM32 to review aircraft's history and found that something had happened at Raleigh when he was not on duty.
- Called a Raleigh to find out what was holding the plane up
  - Found out that an F-18 had crashed by the fuel farm and the wreckage was blocking the road to get fuel trucks to and from the terminal, causing delays
  - Asked to tanker at Hub for the weekend
- Walked to the Duty Director to see if it would be possible to tanker out of Hub for the weekend
  - No, Hub has a fuel shortage problem
- Called Raleigh back to tell bad news that they will just have to take the delays
- Shouted over to Hub & Central SOM stations to tell about Hub fuel shortage
- Wrote down the Hub fuel shortage and the Raleigh tanker delay problems in the SM activity report

AOM Impact on NAS Performance

- AOMs minimize disturbances from requiring ATC intervention
  - 2004 Re-routing of all Tampa Bay area air traffic
- AOMs implement ATC flow control measures
  - Managing airline's response to GDPs and GSPs
  - Response in turn influences duration and effectiveness of GDPs & GSPs
  - Coordinate with dispatchers to ensure adequate fuel for playbook re-routes

Conclusions

- NAS has 3 main players
  - ATC
  - Pilots
  - Airlines that employ the pilots – AOMs in this context
- AOMs serve as an extension of ATC flow control
- AOMs play a large role in the ability of air traffic to recover after operational disruptions
- R&D is needed to enable speedier airline responses to schedule disruptions

Comments & Questions

The Floor is Now Open